

**Remarks/Arguments:**

**Claim Rejections Under 35 U.S.C. §112**

Claims 15-21 stand rejected under 35 U.S.C. §112, second paragraph. The Office Action indicates that the written description fails to disclose corresponding structure, material or acts for the recited "means for monitoring... and determining." Applicants respectfully traverse this rejection.

Paragraphs [0004] through [0008] of the clean copy of the substitute specification explain various acts for determining the hydraulic delivery rate. Additionally, paragraphs [0016] through [0018] of the clean copy of the substitute specification further explain the use of A/D converter 32 and the ECU 16 to monitor desired variables and then make the necessary determinations based on such variables. Applicants respectfully submit that the identified paragraphs of the written description, *inter alia*, disclose the structure and acts corresponding to the recited "means for monitoring... and determining." Withdrawal of this rejection is respectfully requested.

**Claim Rejections Under 35 U.S.C. §103**

Claims 15-28 stand rejected under 35 U.S.C. §103 as unpatentable over U.S. Patent No. 6,517,170 (Hofsaess et al.) in view of U.S. Patent No. 4,255,088 (Newton et al.). Applicants traverse these rejections.

"To establish a *prima facie* case of obviousness, ... the prior art reference (or references when combined) must teach or suggest all the claim limitations." M.P.E.P. §2143. Additionally, as set forth by the Supreme Court in KSR Int'l Co. v. Teleflex, Inc., No. 04-1350 (U.S. Apr. 30, 2007), it is necessary to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the prior art elements in the manner claimed.

The Office Action cites Hofsaess et al. as teaching an electrohydraulic brake system, but acknowledges that Hofsaess et al. "do not teach wherein a means is provided for monitoring the hydraulic delivery rate of the pump and determining quantities of gas or air at the suction side of the pump based on the monitored hydraulic rate." Newton et al. is cited for teaching these missing limitations.

Applicants again respectfully submit that the Office Action does not provide a reason that would have prompted a person of ordinary skill in the relevant field to combine the prior art elements in the manner claimed.

The relevant field of the claimed invention is electrohydraulic brake systems which utilizes low viscosity hydraulic fluids. Newton et al. only explains the use of the pump thereof in the medical field, which generally has fluids having much higher viscosity. There is no reasonable basis for one skilled in the electrohydraulic brake system field to look to the medical devices of Newton et al. or to have any reasonable expectation of success utilizing a high viscosity device in a demanding low viscosity application. Since there is no reasonable basis to combine the cited references, a *prima facie* case of obviousness has not been established.

Assuming for argument sake that the cited references could probably be combined, the references still fail to teach or suggest each limitation of the claimed invention. Independent claim 15 recites an "electrohydraulic brake system for motor vehicles of the 'brake-by-wire' type including a hydraulic pressure source that can be actuated by means of an electronic control unit and is comprised of a hydraulic pump driven by an electric motor and a high-pressure accumulator adapted to be recharged by the pump, wherein a means is provided for monitoring the hydraulic delivery rate of the pump and determining quantities of gas or air at the suction side of the pump based on the monitored hydraulic delivery rate."

As set forth above, the Office Action acknowledges that Hofsaess et al. "do not teach wherein a means is provided for monitoring the hydraulic delivery rate of the pump and determining quantities of gas or air at the suction side of the pump based on the monitored hydraulic rate." Contrary to the assertion in the Office Action, Newton et al. fails to overcome the shortcomings of Hofsaess et al.

Newton et al. explains at column 2, lines 10-14 that "[l]ow compressibility is indicative of the absence of gas in the pump chamber since gas is compressible while the liquid which is to be pumped is not compressible. High compressibility is indicative of the presence of gas."

It is further explained at column 2, lines 36-44, that "[r]eferring to FIG. 2, there is shown an illustrative pump pressure-piston position trace. During the delivery portion of a pump cycle, the pump piston moves from a raised position (in the example of FIG. 1), indicated at  $d_0$ , to a lowered position  $d_2$  while the pressure increases from  $p_0$  to  $P_2$ . During the pressure increase from  $p_0$  to  $p_1$ , the pump chamber is sealed. It is during this time that the compressibility data is obtained, as will be discussed hereinafter with respect to FIG. 6. From  $p_1$  to  $p_2$ , the liquid is delivered from the pump chamber, after which the chamber is refilled as the piston retracts from  $d_2$  back to  $d_0$ ." (emphasis added).

Additionally, Newton et al. explains at column 5, lines 51-56, that "i]llustrative gas detector circuitry 46 together with illustrative pressure transducer 28 is shown in FIG. 6.

Basically, circuitry 46 obtains compressibility data by determining the change of pump pressure with respect to change in pump volume to thus determine the amount of gas, if any, present in pump 10." (emphasis added).

Newton et al. specifically teaches determining the amount of gas present in the pump by determining the compressibility data based on the pump pressure. No where does Newton et al. teach or suggest monitoring the hydraulic delivery rate of the pump or determining quantities of gas or air at the suction side of the pump based on the monitored hydraulic rate. If the Examiner maintains such is taught by Newton et al., it is requested that the Examiner specifically point out where Newton et al. teaches monitoring the hydraulic delivery rate of the pump and determining quantities of gas or air at the suction side of the pump based on the monitored hydraulic rate.

Furthermore, Newton et al. specifically teaches that the pressure is monitored during the delivery portion of a pump cycle (see column 2, lines 36-44 as set forth above) to determine the compressibility which in turn is used to determine the presence of the amount of gas. The pump chamber is sealed during the compressibility measurement and immediately thereafter the fluid is delivered. There is no teaching or suggesting of determining quantities of gas or air at the suction side of the pump based on the monitored hydraulic delivery rate. To the contrary, Newton et al. only teaches determining compressibility, and thereby the amount of gas present, on the delivery side during the delivery portion of the pump cycle.

Since the references, alone or in any reasonable combination, fail to teach or suggest each and every element as set forth in the claim, the Office Action fails to establish a *prima facie* case of obviousness. It is respectfully submitted that independent claim 15 is condition for allowance. Claims 16-21 each depend from claim 15 and should each be allowed for at least the reasons set forth above.

Furthermore, dependent claim 16 further recites that "the hydraulic delivery rate is monitored by determining the electromotive force of the electric motor driving the hydraulic pump." The office action fails to provide any support for this limitation being found in any of the cited references. Since the references, alone or in any reasonable combination, fail to teach or suggest each and every element as set forth in the claim, the Office Action fails to establish a *prima facie* case of obviousness.

Furthermore, dependent claim 17 further recites that "the hydraulic delivery rate is monitored by determining the electric power consumption of the electric motor driving the hydraulic pump." The office action fails to provide any support for this limitation being found in

any of the cited references. Since the references, alone or in any reasonable combination, fail to teach or suggest each and every element as set forth in the claim, the Office Action fails to establish a *prima facie* case of obviousness.

Furthermore, dependent claim 18 further recites that "the hydraulic delivery rate is monitored by determining the rotational speed of the electric motor driving the hydraulic pump." The office action fails to provide any support for this limitation being found in any of the cited references. Since the references, alone or in any reasonable combination, fail to teach or suggest each and every element as set forth in the claim, the Office Action fails to establish a *prima facie* case of obviousness.

Similar to claim 15, independent claim 22 recites a "method of monitoring an electrohydraulic brake system for motor vehicles of the 'brake-by-wire' type including a hydraulic pressure source that can be actuated by means of an electronic control unit and is comprised of a hydraulic pump driven by an electric motor and a high-pressure accumulator adapted to be recharged by the pump, wherein quantities of gas or air at the suction side of the pump are detected by determining the hydraulic delivery rate of the pump."

As explained above, the cited references do not teach or suggest detecting quantities of gas or air at the suction side of the pump by determining the hydraulic delivery rate of the pump. Since the references, alone or in any reasonable combination, fail to teach or suggest each and every element as set forth in the claim, the Office Action fails to establish a *prima facie* case of obviousness.

It is respectfully submitted that independent claim 22 is condition for allowance. Claims 23-28 each depend from claim 22 and should each be allowed for at least the reasons set forth above.

Furthermore, dependent claim 23 further recites that "the hydraulic delivery rate is determined by analyzing the electromotive force of the electric motor driving the pump." The office action fails to provide any support for this limitation being found in any of the cited references. Since the references, alone or in any reasonable combination, fail to teach or suggest each and every element as set forth in the claim, the Office Action fails to establish a *prima facie* case of obviousness.

Furthermore, dependent claim 24 further recites that "the hydraulic delivery rate is determined by analyzing the electric power consumption of the electric motor driving the pump." The office action fails to provide any support for this limitation being found in any of the cited references. Since the references, alone or in any reasonable combination, fail to teach

or suggest each and every element as set forth in the claim, the Office Action fails to establish a *prima facie* case of obviousness.

Furthermore, dependent claim 25 further recites that "the hydraulic delivery rate is determined by analyzing the rotational speed of the electric motor driving the pump." The office action fails to provide any support for this limitation being found in any of the cited references. Since the references, alone or in any reasonable combination, fail to teach or suggest each and every element as set forth in the claim, the Office Action fails to establish a *prima facie* case of obviousness.

It is respectfully submitted that each of the pending claims is in condition for allowance. Early reconsideration and allowance of each of the pending claims are respectfully requested.

If the Examiner believes an interview, either personal or telephonic, will advance the prosecution of this matter, it is respectfully requested that the Examiner get in contact with the undersigned to arrange the same.

Respectfully submitted,



Robert P. Seitter, Reg. No. 24,856  
Glenn M. Massina, Reg. No. 40,081  
Attorneys for Applicants

RPS/GMM/mc

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☒ P.O. Box 980  
Valley Forge, PA 19482  
(610) 407-0700

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